REMARKS

By this amendment, applicants have amended the specification to insert appropriate headings therein and to include reference numerals 1 - 4 from Figure 1 in the detailed description of the invention from page 6, line 35 to page 8, line 2. The abstract has been amended in order to overcome the objection thereto in the paragraph bridging pages 2 and 3 of the office action.

Applicants have also amended the claims to eliminate the European-style "characterized in that" format and to indicate that the at least one additive is selected from the group consisting of urea and urea derivatives. The claims have also been amended to use proper Markush language and to eliminate the word "preferably."

In view of the foregoing amendments to the specification, claims and abstract, reconsideration and withdrawal of the objection to the specification, claims and abstract and of the rejection of the claims under 35 USC 112, second paragraph, are requested.

Applicants note the Examiner's allegation that the terms "metallocene derivatives" and "urea derivatives" render the claims vague and indefinite. Applicants traverse this allegation and submit that the word "derivatives" is understood in the chemical field and is not as indefinite as alleged by the Examiner at the top of page 4 of the office action. For example, one definition of the word "derivative", e.g., from Hackh's Chemical Dictionary is "an organic compound containing a structural radical similar to that from which it is derived, e.g., benzene derivatives containing the benzene ring." By the terms "metallocene derivatives " and "urea derivatives," applicants are referring to compounds containing a structural radical similar to metallocene or urea, e.g., 1,1'-diacetylferrocene or N-N'-dimethylurea. See, Table 1 at

page 4 of applicants' specification. Accordingly, it is submitted these terms are not vague and indefinite.

Applicants note the Examiner's comments concerning the drawings on page 2 of the office action, i.e., that "[t]he features illustrated in the 'Fan heater' and 'Vaporizer' in figure 1 appear to be unclear and incomplete." Applicants traverse this rejection and submit that Figure 1 is complete. Should the Examiner continue to deem otherwise, the Examiner is respectfully requested to point out which features the Examiner deems to be unclear and incomplete, e.g., by providing applicants with a copy of Figure 1 highlighted to show the features deemed unclear and incomplete.

Claims 1 - 10 stand rejected under 35 USC 103 as being unpatentable over United States Patent No. 5,756,929 to Lundstrom et al. Applicants traverse this rejection and request reconsideration thereof.

The presently claimed relates to a process for the reduction of harmful gases in gas mixtures from pyrotechnic reactions, to an agent for pyrotechnic gas generation and to a device for pyrotechnic gas generation. According to the present invention, as now set forth in the claims, at least one additive selected from the group consisting of urea and urea derivatives is provided. The additive vaporizes due to the heat generated in the pyrotechnic reaction and converts the harmful gases into non-toxic compounds in a homogenous gas reaction.

The patent to Lundstrom et al discloses a non-azide gas generating gas composition. While this patent discloses various compounds which may be contained in the composition in order to reduce the formation of toxic carbon monoxide and nitrogen oxides, the patent does not disclose the addition of urea or urea derivatives. The Examiner notes that the patent discloses the addition of ballistic modifiers

including sulfur, metal sulfides, metallocenes and ferrocenes. However, the patent does not appear to disclose an additive for converting harmful gases selected from the group consisting of urea and urea derivatives. Therefore, it is submitted the Lundstrom et al patent does not disclose and would not have suggested the presently claimed invention.

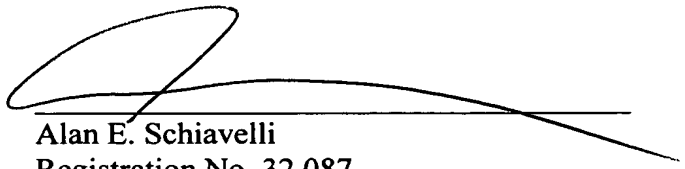
Applicants note the Examiner has cited a number of additional documents as allegedly being indicative of the state of the art. However, since these documents were not applied in rejecting claims formerly in the application, further discussion of these documents is deemed unnecessary.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 306.37599X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



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IN THE SPECIFICATION:

Page 6, amend the paragraph beginning at line 35 to read:

The nitrogen monoxide is fed in with the aid of a gas bag which, filled beforehand, is connected to the three-way stopcock 1. The calibrating gas (nitrogen with 80 ppm nitrogen monoxide) is passed directly to the chemiluminescence apparatus from the pressure bottle via a pressure reducer 4. The gas should flow into the analyzer through three way stopcock 3 without pressure. Approx. 50% or 0.6 l/min of the amount of gas required must therefore flow out via a T-piece with an excess line. The excess is passed into a fume cupboard. The excess line has a length of more than 2 m, in order to avoid mixing of the calibrating gas with the air of the atmosphere. A flow meter is also installed on the line, so that the predetermined value for the volume flow can be monitored. Only pipes with a smooth surface and made of inert material, such as PTFE, glass or steel, have been used as the gas lines.

Page 6, amend the paragraph beginning at line 18 to read:

A specific amount of the substance to be tested is weighed into a glass dish and spread uniformly on the glass base. The glass is then placed in the middle of the heating plate and the temperature setting of the vaporizer is checked. Thereafter, the lid is placed on the plastics container and the lever on the clamping ring is pressed closed. The screw fittings on the container connections are now tightened firmly, so that tightness of the container is ensured. The thermocouple is connected to the voltmeter and the lines from the fume cupboard and filter must be connected to the three-way stopcocks 1,2 of the container lid, which must be set such that the container is closed off. Calibration can take place while the container air is being heated up to

45°C with the fan heater. As soon as the temperature in the reactor has reached 45°C, nitrogen monoxide is metered into the container via a gas bag at three-way stopcock ~~I~~ 1, this being partly converted into nitrogen dioxide with atmospheric oxygen by an equilibrium reaction. As soon as there is nitrogen monoxide in the reactor, measurement of the time is started.

IN THE CLAIMS:

1. (Amended) Process for the reduction of harmful gases in gas mixture from pyrotechnic reactions, ~~characterized in that~~ comprising vaporizing at least one additive selected from the group consisting of ~~metallocenes, metallocene derivatives~~; urea~~;~~ and urea derivatives~~, sulphur and/or sulphur compounds is vaporized~~ during pyrotechnic reaction by the heat generated in the pyrotechnic reaction and converting the harmful gases ~~are converted~~ into non-toxic compounds in a homogeneous gas phase reaction.

2. (Amended) Process for the reduction of harmful gases in gas mixtures from pyrotechnic reactions according to claim 1, ~~characterized in that~~ wherein the at least one additive ~~chosen~~ has a melting point > 105°C and vaporizes below 400°C.

3. (Amended) Process for the reduction of harmful gases in gas mixtures from pyrotechnic reactions according to claim 1, ~~characterized in that ferrocene, 1,1'-diacetylferrocene, titanocene pentasulphide,~~ wherein the at least on additive is selected from the group consisting of urea, N-formylurea, N,N'-dimethylurea~~;~~ and N,N-dimethylurea ~~and/or sulphur, preferably ferrocene, is employed as the additive~~.

4. (Amended) Agent for pyrotechnic gas generation, ~~characterized in that, in addition to the~~ comprising a gas-generating substance, ~~it comprises~~ and an additive selected from the group consisting of ~~metallocenes, metallocene derivatives~~; urea~~;~~ and urea

derivatives~~, sulphur and/or sulphur compounds~~ which vaporizes due to the heat generated in the pyrotechnic reaction.

5. (Amended) Agent for pyrotechnic gas generation according to claim 4, ~~characterized in that~~ wherein the at least one additive chosen has a melting point > 105°C and vaporizes below 400°C.

6. (Amended) Agent for pyrotechnic gas generation according to claim 4, ~~characterized in that ferrocene, 1,1'-diacetylferrocene, titanocene pentasulphide,~~ wherein the at least one additive is selected from the group consisting of urea, N-formylurea, N,N'-dimethylurea~~,~~ and N,N-dimethylurea ~~and/or sulphur, preferably ferrocene, is employed as the additive~~.

7. (Amended) Agent for pyrotechnic gas generation according to claim 4, ~~characterized in that~~ wherein at least one component of the gas-generating substance is coated with the at least one additive.

8. (Amended) ~~Device~~ In a device for pyrotechnic gas generation, ~~characterized in that~~ the improvement comprising at least one additive selected from the group consisting of ~~metallocenes, metallocene derivatives,~~ urea~~,~~ and urea derivatives~~, sulphur and/or sulphur compounds is~~ introduced into the flow path of the working gas.

9. (Amended) Device for pyrotechnic gas generation according to claim 8, ~~characterized in that~~ wherein the at least one additive ~~chosen~~ has a melting point >105°C and vaporizes below 400°C.

10. (Amended) Device for pyrotechnic gas generation according to claim 8, ~~characterized in that ferrocene, 1,1'-duacetylferrocene, titanocene pentasulphide,~~ wherein the at least one additive is selected from the group consisting of urea, N-formylurea, N,N'-dimethylurea~~,~~ and N,N-dimethylurea ~~and/or sulphur, preferably~~

~~ferrocene, is employed as the additive~~.

IN THE ABSTRACT:

The present invention provides for the reduction of harmful gases, e.g., nitrogen oxides, in gas mixtures from pyrotechnic reactions, e.g., in gas generation for airbag systems. The reduction of harmful gases is achieved by vaporizing at least one additive selected from the group consisting of metallocenes, metallocene derivatives, urea, urea derivatives, sulphur and sulphur compounds during the pyrotechnic reaction by the heat generated in the pyrotechnic reaction, and converting the harmful gases in a homogenous gas phase reaction.